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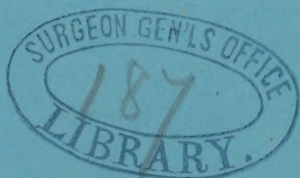
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DISCOVERY IN SCIENCE.

BY

GEORGE M. BEARD, A.M., M.D.



NEW YORK:

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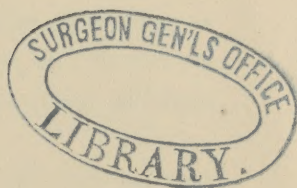
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WHAT CONSTITUTES A DISCOVERY IN SCIENCE ?

[The following is a portion of the preface to the second edition of my work on Nervous Exhaustion (Neurasthenia).

As the question is one of general interest to scientific thinkers and discoverers, apart from its application to the claims of my work, I have ventured to reprint it in the present form.]

On the part of some friendly critics, the inquiry has been made whether the philosophy of neurasthenia, as herein taught, originated with its author. This universal inquiry, which is addressed to every new claim in science, is the product, not so much of moral as of intellectual deficiency; expressive of the want of an early discipline in logic and the consequent arrest of development of the scientific sense, rather than of any severe passion for injustice or any desire to carry the old maxim, "speak only good of the dead," to the extreme of speaking only ill of the living.

But even those best trained in the principles of science, as taught in the writings of Whewell and Jevons, find therein no clearly formulated solution to the daily recurring problem, *What constitutes a discovery in science?*

So far as is practicable in a few words, I will here attempt to give this inquiry a general answer that shall apply not only to this special topic, but to all scientific discoveries in every department.

The first honor in science belongs to him who organizes. To organize a science—to vitalize it, so that it may live and grow—is to make one's self expert in it, and to point out the way for others also to become experts.

There are three stages of evolution through which all new ideas, before they are received into the full and unchallenged fellowship, have passed, are now passing, or are destined to pass.

First—the stage of indifference.

In this stage, the thinker not only has no opponents, but no audience; he must be his own listener and critic, as well as his own and only disciple. Not a few of the great discoverers, like Copernicus, have died before their discoveries could evolve out of this long and dreary period.

Secondly—the stage of denial.

A few are awaking to the new truth, but declare that it is not truth. This is the non-expert's hour and the delusionist's opportunity to lead that opposition which is, everywhere, the inspiration and the sustenance of genius. Active opposition is, therefore, an encouragement to the friends of ideas; it is the first sign of growth—the plant has burst through the soil, and must meet with the winds and the storms.

Thirdly—the stage of contests of priority.

Now men say the discovery is important and true, but did not originate with the discoverer; some non-expert hath done this. The activity of this stage keeps history alive; since those who have risen to its level drink the past to its dregs for proofs that the world's work has not been done by its workers; they become themselves original in their search for originality. In this stage, indeed, antiquarian research

attains oftentimes the wisdom of philosophy and the perfection of art; since it is demonstrated again and again that what we call modern science is really ancient; that the latest truths are but survivals of the oldest; and that Newton and Faraday, Hunter and Harvey, Fulton and Morse were but feeble and conscienceless imitators. During this very year, it has been shown with a clearness and force that suggest pure mathematics, that Edison, the controller of hundreds of patents, is one of the few Americans who never invented anything.

These three stages are not always distinctly defined, but they always exist, and must be traversed by every new thought that comes to an unwelcoming world.

The philosophy of this work, after long lingering in the first, is now passing, in the minds of students of this side of the nervous system, from the second into the third of these stages.

It has been asked whether neurasthenia is a new disease. A disease is new, that is, new to science, however old it may be in experience, its discovery dates from the time when it is made a part of the organized knowledge of men. Over the whole empire of science this principle, based on the unconscious reasoning of the generations, has attained the force and the sovereignty of law. For æons upon æons, men have looked upon the stars, but Copernicus first saw them with expert eyes and brought astronomy into science; for thousands of years before Aristotle men had used deduction; for thousands of years before Bacon they had used induction: but Aristotle and Bacon, formulating the instincts of mankind—the highest reach of all philosophy—are yet the organizers of reason; from the foundations of the earth lightning had flamed in the sky, but Franklin first harnessed it in the service of men; Jenner

was not the first to practise vaccination, neither was he the first to practise it successfully ; but he was the first to practise it scientifically, and he is justly honored as its father. Others had produced anæsthesia by inhalation, but Morton organized it and gave it to surgery and the world. A thousand Icelanders, through thousands of years, may have wandered to these coasts, but Columbus was the discoverer of America. The theory of natural selection had been the dream of many generations, and in various countries, including our own, had been suggested and expressed ; but only Darwin organized it, made himself expert in it, and prepared the way for others also to become expert in this realm of biology. Not the prospectors, nor the hunters and trappers, but those who develop the mines and level the wilderness are the pioneers of civilization and the real founders of States.

Near the great track of navigation lies this unknown realm of pathology—neurasthenia. Many voyagers may have touched these shores, or in wonder have gazed upon them from the distant main, or, perchance have been borne unwillingly towards them by hostile gales, carrying back unheeded or forgotten tidings. But what is this mysterious land ? Is it an island, is it a peninsula, is it a continent ? Toward what seas, through what climes does it extend ? Where are the boundaries between it and the contiguous realms of hypochondria, of hysteria, of malaria, and of insanity ? What are its fauna, its flora—its streams, its lakes, its mountain peaks, its precious ores, its populations ? Thousands have guessed at these queries—he who answers them brings neurasthenia into science, and makes it the permanent possession of mankind.

Here, as everywhere, that automatic action of the faculties

that we call instinct, comes nearer to the heart of truth than the conscious and controlled action that we call reason; it is when men essay to become logical that they are most likely to stumble and fall. If the above analysis be of value, it is in this—that it formulates the instinctive recognition of mankind, which always goes with the stream of justice, as reason so often goes against it, and in time fails not to confer the crown of science on those who organize it.

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